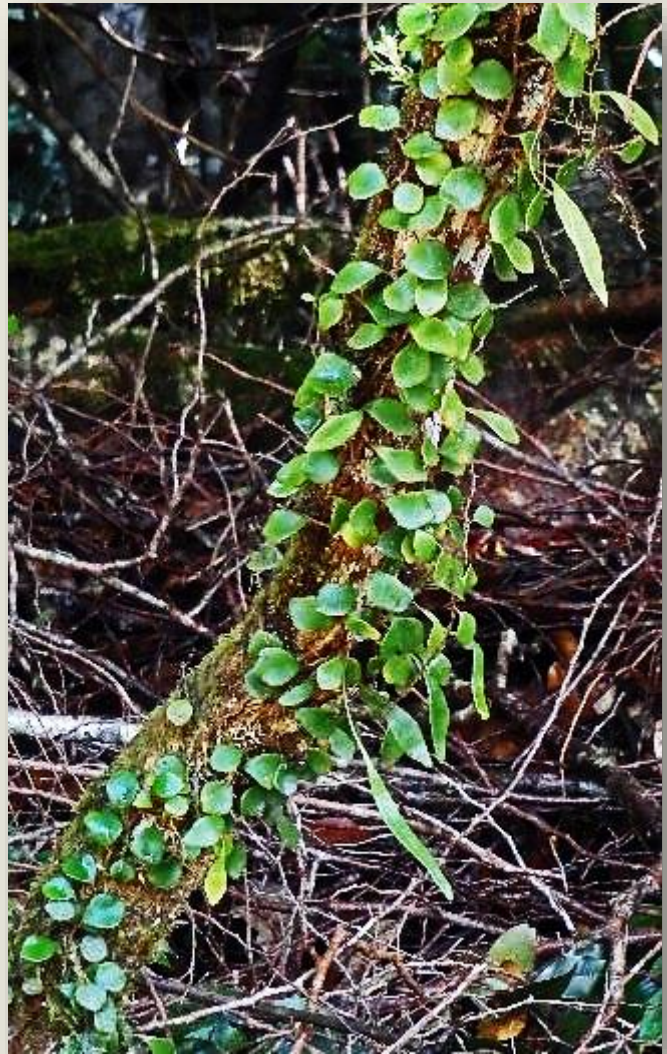


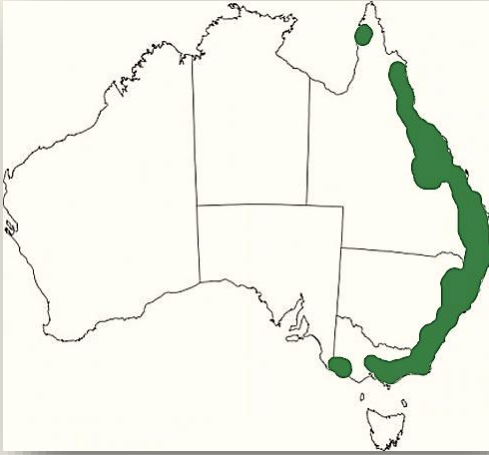
Pyrrosia *rupestris* Rock Felt Fern

The Rock Felt Fern, *Pyrrosia rupestris*, is a sturdy epiphytic (grows on other plants) or epilithic fern. It grows up trees and on rocks in rainforests and wet sclerophyll forest gullies along the east coast of Australia.

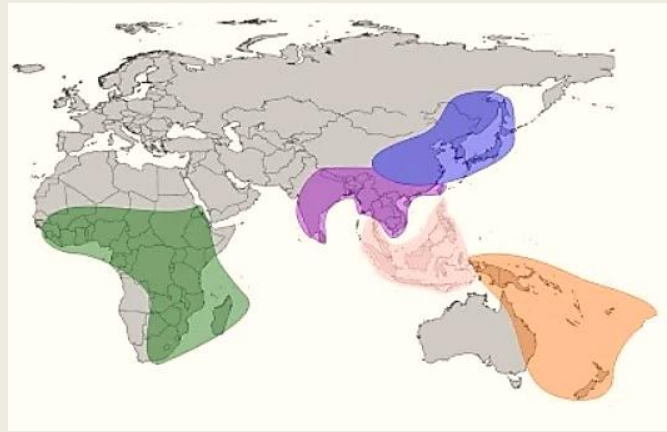


Spores on the undersurface of elongated fronds.
<https://florafnq.wordpress.com/2010/11/23/pyrrosia-rupestris-rock-felt-fern-polypodiaceae/>

We usually expect ferns to have large, soft, feathery fronds. The Rock Felt Fern is quite the opposite, and has thick, almost leathery leaves of two sorts: small, rounded leaves (fronds) unable to form spores and elongated leaves, with rounded clusters of reproductive spores on the undersurface. However, it is the thick leaves that hold this fern's *dark secret*.



Distribution of *Pyrrosia rupestris* in Australia. Map modified from: Atlas of Living Australia; [Search: species: Pyrrosia rupestris | Occurrence records | Atlas of Living Australia](#)



Distribution of the genus *Pyrrosia* worldwide. Map modified from Wei et al. 2017. <https://doi.org/10.1038/s41598-017-12839-w>



The rhizomes (stems) of the fern are often rooted at the base of trees, climbing all the way to the upper crown. Leaves at the base grow in relatively low light, cool and often moist conditions whereas those in the crown are exposed to high light, high temperatures and spasmodic periods of desiccation. The leaves deep in the lower canopy photosynthesise with the common C3 pathway while leaves in the higher, drier crown of the tree use CAM photosynthesis, where stomates remain closed during the day to limit water loss and open only at night. In other words, one plant, two photosynthetic processes to suit very different environmental conditions.

Worldwide there are about 50 - 100 *Pyrrosia* species, widely distributed across Asia and the Pacific with a disjunct distribution in Africa and Madagascar. Although most *Pyrrosia* species are drought tolerant, only five are known to utilise the CAM photosynthetic pathway.

Pyrrosia rupestris growing on the trunk of an Antarctic Beech, *Nothofagus moorei*, in Werrikimbe National Park, north-eastern NSW.

Southern Asia, including the Indo-China Peninsula, southwestern and southern China, is the most likely place of origin for the genus. Long distance, transoceanic dispersal is thought responsible its rather unusual disjunct distribution to Africa and Madagascar likely mediated by bird migration.

Wei X, Qi Y, Zhang X. et al. 2017. Phylogeny, historical biogeography and characters evolution of the drought resistant fern *Pyrrosia* Mirbel (Polypodiaceae) inferred from plastid and nuclear markers. Sci Rep 7, 12757.

<https://doi.org/10.1038/s41598-017-12839-w>

Wilson PG. Plantnet: <https://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Pyrrosia~rupestris>

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